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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/622,951

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EXAMINER

NGUYEN, TOAN D

ART UNIT

PAPER NUMBER

2616

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/622,951	<b>Applicant(s)</b> KWON ET AL.	
	<b>Examiner</b> TOAN D. NGUYEN	<b>Art Unit</b> 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 21-25 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21, 24 and 25 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 8-10 and 22 is/are rejected.
- 7) ☒ Claim(s) 3, 5-7, 10 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-10 and 21-25 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-2, 4, 8-9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petry et al. (US 6,538,985) in view of Yonge, III (US 6,987,770).

For claim 1, Petry et al. disclose channel reservation media access control protocol using orthogonal frequency division multiplexing, comprising:

(a) assigning a node number to each station and assigning subchannels corresponding to the node number of each station (col. 4, lines 24-27);

(b) constructing, by the starting station, tones that correspond to the assigned subchannels, the tones assigned to the starting station and the destination, and the tones including the node number of the starting station and the node number of the destination station, and being constructed as single OFDM symbol (col. 4, lines 18-19), and placing the single OFDM symbol in a frame for transmission (col. 4, lines 24-27).

However, Petry et al. do not expressly disclose:

(c) stations other than the starting station detecting the tones from the frame, recovering the node number of the starting station and the destination using indices of the subchannels obtained from the tone, and recognizing the starting station and the destination station.

In an analogous art, Yonge, III discloses:

(c) stations (figure 40, reference station I) other than the starting station (figure 40, reference station A) detecting the tones from the frame (figure 40, reference 802, col. 46, lines 11-12), recovering the node number of the starting station and the destination using indices of the subchannels obtained from the tone, and recognizing the starting station and the destination station (col. 46, lines 11-14, and col. 46, lines 20-22).

One skilled in the art would have recognized the stations other than the starting station detecting the tones from the frame, and would have applied Yonge, III's frame forwarding with responses in Petry et al.'s OFDM frames. Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention, to use Yonge, III's frame forwarding in an adaptive network in Petry et al.'s channel reservation media access control protocol using orthogonal frequency division multiplexing with the motivation being to deliver frames using acknowledged service according to the forwarding frame structure for frame forwarding with a response (col. 45, lines 40-43).

For claim 2, Petry et al. disclose wherein the number of subchannels assigned to each node number in step (a) is calculated by dividing the number of total subcarriers by the number of nodes included in the home network (col. 4, lines 27-32).

For claim 4, Petry et al. disclose wherein the OFDM symbol is placed in a foremost part of the frame in step (b)(col. 4, lines 2-6).

For claim 8, Petry et al. disclose wherein the node number detection in step (c) is performed by detecting the node number of a corresponding station by modulo-calculating the indices of the subchannels by the maximum number of nodes constituting the home network (col. 4, lines 27-32).

For claim 9, Petry et al. disclose wherein a node number that is most frequently detected is selected, if the node number is detected at least once (col. 7, lines 6-10).

For claim 22, Petry et al. disclose channel reservation media access control protocol using orthogonal frequency division multiplexing, comprising:

(a) assigning a node number to each station and assigning subchannels corresponding to the node number of each station (col. 4, lines 24-27);

(b) the starting station constructing tones corresponding to the subchannels assigned to its own node number and the node number of the destination station as a

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single OFDM symbol (col. 4, lines 18-19), and placing the OFDM symbol in a frame for transmission, wherein the OFDM symbol is placed in a foremost part of the frame (col. 4, lines 24-27).

However, Petry et al. do not expressly disclose:

(c) stations other than the starting station detecting the tones from the frame, recovering the node number using indices of the subchannels obtained from the tones, and recognizing the starting station and the destination station, wherein a station that determines that it is the destination station receives additional symbols of the frame, while stations other than the destination station do not receive the additional symbols of the frame.

In an analogous art, Yonge, III discloses:

(c) stations (figure 40, reference station I) other than the starting station (figure 40, reference station A) detecting the tones from the frame (figure 40, reference 802, col. 46, lines 11-12), recovering the node number using indices of the subchannels obtained from the tones, and recognizing the starting station and the destination station, wherein a station that determines that it is the destination station receives additional symbols of the frame, while stations other than the destination station do not receive the additional symbols of the frame (col. 46, lines 11-14, and col. 46, lines 20-22).

One skilled in the art would have recognized the stations other than the starting station detecting the tones from the frame, and would have applied Yonge, III's frame forwarding with responses in Petry et al.'s OFDM frames. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use Yonge, III's

frame forwarding in an adaptive network in Petry et al.'s channel reservation media access control protocol using orthogonal frequency division multiplexing with the motivation being to delivers frames using acknowledged service according to the forwarding frame structure for frame forwarding with a response (col. 45, lines 40-43).

***Allowable Subject Matter***

5. Claims 3, 5-7, 10 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 21, 24 and 25 are allowed.

Regarding claim 21, the prior art fails to teach a combination of the steps of:

(a) assigning a node number to each station and assigning subchannels corresponding to the node number of each station, wherein the assignments of the subchannels are performed according to the following equation:

$$D_i = \{(k \bmod d) == DSN\}, k < N/2$$

$$S_i = \{(k \bmod d) == SSN\}, k > N/2, i = 1, \dots, M/2,$$

where N indicates the number of total subcarriers, DSN indicates a node number of the destination station, SSN indicates a node number of the starting station,  $D_i$  indicates an index of a subchannel assigned to the destination station, and  $S_i$  indicates an index of a subchannel assigned to the starting station, in the specific combination as recited in the claim.

Regarding claim 24, the prior art fails to teach a combination of the steps of:

(b) the starting station constructing tones corresponding to the subchannels assigned to its own node number and the node number of the destination station as a single OFDM symbol, and

placing the OFDM symbol in a frame for transmission, wherein phases of the tones are rotated pseudo-randomly according to the following equation:

$$X_k = \{0, S, \text{ or } D, \quad 0 \leq k \leq 256$$

$$\{ Q_k, k = S, \text{ , provided } Q_k \text{ rotates by } \pi / 2, p = (k \bmod 4),$$

where D, indicates indices of subchannels assigned to the destination station, and S, indicates indices of subchannels assigned to the starting station, in the specific combination as recited in the claim.

Regarding claim 25, the prior art fails to teach a combination of the steps of:

b) the starting station constructing tones corresponding to the subchannels assigned to its own node number and the node number of the destination station as a single OFDM symbol, and placing the OFDM symbol in a frame for transmission, wherein the tones are expressed as

$x_{k,m} = \sqrt{M} x_k$ , in the time domain in order to have the same power as the power of subsequent OFDM symbols,

where M indicates the number of subchannels assigned to a single node number, N indicates the number of total subcarriers, and  $x_k$ , indicates each modulated subcarrier in which a cyclic prefix is inserted, in the specific combination as recited in the claim.

### **Conclusion**



7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOAN D. NGUYEN whose telephone number is (571)272-3153. The examiner can normally be reached on M-F (7:00AM-4:30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on 571-272-6703. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/T. D. N./

Examiner, Art Unit 2616

/FIRMIN BACKER/

Supervisory Patent Examiner, Art Unit 2616